

The Solar Dynamics Observatory: Your on-orbit eye on the Sun

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The Solar Dynamics Observatory (SDO) was launched on February 11, 2010 into the partly cloudy skies above Cape Canaveral, Florida. Over the next month SDO moved into a 28 degree inclined geosynchronous orbit at the longitude of the ground station in New Mexico. SDO is the first Space Weather Mission in NASA's Living With a Star Program. SDO's main goal is to understand and predict those solar variations that influence life on Earth and our technological systems. The SDO science investigations will determine how the Sun's magnetic field is generated and structured, how this stored magnetic energy is released into the heliosphere as the solar wind, energetic particles, and variations in the solar irradiance. The SDO mission consists of three scientific investigations (AIA, EVE, and HMI), a spacecraft bus, and a dedicated Ka-band ground station to handle the 150 Mbps data flow. SDO continues a long tradition of NASA missions providing calibrated solar spectral irradiance data, in this case using multiple measurements of the irradiance and rocket underflights of the spacecraft. The other instruments on SDO will be used to explain and develop predictive models of the solar spectral irradiance in the extreme ultraviolet. Science teams at LMSAL, LASP, and Stanford are responsible for processing, analyzing, distributing, and archiving the science data. We will talk about the launch of SDO and describe the data and science it is providing to NASA.